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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/691,198 | 10/22/2003 | Bing Chiang | 2479.2028-001 | 5645 |
| 21005 | 7590 | 03/02/2004 | EXAMINER | |
| HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133 | | | GLENN, KIMBERLY E | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2817 | |

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/691,198

Applicant(s)

CHIANG ET AL.

Examiner

Kimberly E Glenn

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2-15 and 17-32 of copending Application No. 09/774534. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 10/691198 are broader than the claims of 09/774534. The independent claims of 10/691198 do not recited the limitation that the output port is coupled to the input port by means coupled lines as the independent claims of 09/774534 recite.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 16 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16 and 34 recite the limitation "the bias voltage port" in line 2 of each claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6-8, 14, 15, 18-21, 24-26, 29, 32, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arevalo US Patent 6,104,986.

Arevalo disclose a input port (port 1) coupled to receive a input signal; an output Port (port 2) coupled to provide the an output signal, the output port coupled to the input port, such coupling between the input port and the output port having a characteristic input/output impedance; a first quadrature port (port 3) and a second quadrature port (port 4), the quadrature port coupled to one another, such coupling between quadrature ports having a characteristic quadrature port impedance; a first impedance transformer (112) coupled between the input port (port 1) and the a first one of the quadrature ports (port 3); and a second impedance transformer 108 coupled between the a second one of the quadrature ports(port 4) and the output port (port 2). A branch line provides the coupling between the input port and the output port. A branch line provides the coupling between quadrature ports. The first and second impedance transformers are implemented as one-quarter-wavelength section of transmission line. A diode is connected to each of the quadrature ports.) Arevalo disclose that the microstrip elements (108 110 112 114) have widths that correspond to the desired impedance of each leg. The four legs need not have the same width. The method steps to the above apparatus are inherent. (See figure I and column 2 line 43 through column 3 lines 57)

Arevalo is shown to teach all the limitations of the claims with the exceptions of (1) the characteristic input/output impedance being different from the characteristic quadrature port impedance, (2) the first impedance transformer transforming the characteristic input/output impedance across the input port and output port to the characteristic quadrature port impedance across the quadrature ports, (3) the second impedance transformer transforming the characteristic quadrature impedance across

the quadrature ports to the characteristic input/output impedance, (4) the characteristic input/output impedance is 50 ohms, (5) the characteristic quadrature port impedance is 20 ohms and (6) the characteristic quadrature port impedance is lower than the characteristic input/output port impedance.

One skilled in the art at the time the invention was made would have found it obvious to optimize the impedance match between the input and output ports as well as quadrature ports. Therefore the characteristic input/output impedance and the characteristic quadrature impedance need not be the same. Arevalo states that "The microstrip elements have widths that correspond to the desired impedance of each leg, and have lengths that correspond to $1/4$ of the wavelength of the primary frequency of the input signal." Arevalo further states that the four legs need not have the same widths and lengths. Therefore, the impedance between the ports are not necessarily the same.

One skilled in the art at the time the invention was made would have found it obvious to have the first impedance transformer transform the characteristic input/output impedance to the characteristic quadrature port impedance in order to optimize the impedance match between the input and output ports and the quadrature ports.

One skilled in the art at the time the invention was made would have found it obvious to have the second impedance transformer transform the characteristic quadrature ports impedance to the characteristic input/output impedance in order to optimize the impedance match between the input and output ports and the quadrature ports.

One skilled in the art at the time the invention was made would have found it obvious to the have characteristic input/output port impedance be 50 ohms, since it has been held that discovering an optimum value of a variable involves only routine skill the art.

One skilled in the art at the time the invention was made would have found it obvious to the have characteristic quadrature impedance be 20 ohms, since it has been held that discovering an optimum value of a variable involves only routine skill the art.

Claims 4, 5, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arevalo US Patent 6,104,986 in view of Buoli US Patent 4,697,161

See the above 35 USC 103 rejection for details of Arevalo reference.

Thus, Arevalo is shown to teach all the limitation of the claim with the exception of the coupling between the input port and the output port being provided by coupled lines and the coupling between the quadrature ports being provided by coupled lines.

Buoli disclose in figure 4, a four port circuit wherein the ports are connected through coupled lines.

One of ordinary skill in the art would have found to obvious to replace the general branching lines of Arevalo with the coupled lines as taught by Buoli. The motivation for this modification would have been to provide reduce the cross section of the circuit which secures good operation up to 20 GHz and provides direct current isolation of the four ports. (Column 1 lines 53-59)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miller et al US Patent 4,539, 535.

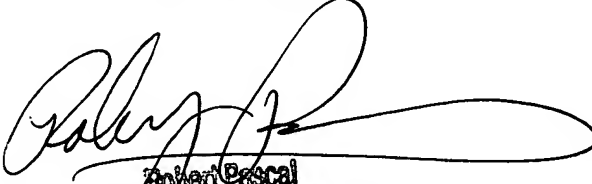
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (571)-272-1761. The examiner can normally be reached on Monday-Friday 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571)-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimberly E Glenn
Examiner
Art Unit 2817

keg



Robert Pascal
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